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Longfin Inshore Squid

by
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Longfin inshore squid (*Loligo pealeii*) school in continental shelf and slope waters from Newfoundland to the Gulf of Venezuela. Within its range of commercial exploitation (Georges Bank to Cape Hatteras) longfin squid are considered to be a unit stock. North of Cape Hatteras, individuals migrate seasonally, moving offshore during late autumn to overwinter in warmer waters along the edge of the continental shelf and inshore during the spring and early summer. Longfin squid live for less than one year, grow rapidly, and spawn year-round. Individuals hatched in summer generally grow more rapidly than those hatched in winter. The species is sexually dimorphic, with most males growing faster and attaining larger sizes than females. Some males grow to more than 40 cm (16 in.) dorsal-mantle length, although most squid harvested in the commercial fishery are smaller than 30 cm (12 in.) long.

The U.S. squid fishery began in the late 1800s as a source of bait, and from 1928 to 1967, annual squid landings from Maine to North Carolina (including northern shortfin squid, *Illex illecebrosus* landings) ranged from 500-2,000 mt. A directed foreign fishery developed in the late 1960s, and distant-water fleets exploited longfin squid throughout the 1970s and early 1980s. Landings fluctuate widely, because generations have minimal overlap and seasonal dynamics are sensitive to environmental factors. Annual landings averaged 19,900 mt from 1967 to 1986 with a maximum of 37,600 mt taken in 1973. Since 1986 there have been no allocations to foreign nations. From 1988-1997, U.S. landings have averaged 19,100 mt annually. In 1998, landings totaled 18,400 mt.

Most landings are taken from Southern New England and Mid-Atlantic waters. Fishing patterns reflect seasonal distribution; most effort is directed offshore from October to March and inshore from April to September. The fishery is dominated by small-mesh otter trawlers, but substantial landings are also taken from pound nets and fish traps in spring and summer. Since 1987, winter fishing effort has increased, and annual offshore landings have generally been three-fold greater than inshore landings.

The longfin squid stock is managed by the Mid-Atlantic Fishery Management Council under the

Atlantic Mackerel, Squid, and Butterfish Fishery Management Plan. Management measures specified under Amendment 8 to the FMP include a moratorium on permits, seasonal quota specifications and gear restrictions.

In 1998, management targets for the longfin squid stock were re-specified. The target fishing mortality rate is 75% of the rate that produces maximum sustainable yield, and the minimum stock size threshold (40,000 mt) is one-half of that which produces maximum sustainable yield ($BMSY = 80,000$ mt).

Indices of abundance from bottom trawl surveys are highly variable. Stock biomass indices from the NEFSC winter, spring and autumn bottom trawl surveys as well as the Massachusetts spring survey have been below average for the last several years. Current indices of recruitment are also below average.

The short lifespan of longfin squid combined with their rapid growth and capacity to spawn year-round leads to a seasonally dynamic resource. The potential for recruitment overfishing of the stock is substantial because longfin squid recruit to the fishery and to the spawning stock in the same year.

A recent assessment indicated that stock size at the beginning of 1999 was 42,000 mt, near the minimum biomass threshold, and that fishing mortality exceeded F_{MSY} in 1998. The stock is considered to be approaching an overfished state, and overfishing was occurring. For the 2000 fishing year (January-December), domestic annual harvest (DAH) was set at 13,000 mt. The annual quota was allocated seasonally based on historical patterns of landings.

For further information

Brodziak, J. K. T., and W. K. Macy, III. 1996. Growth of long-finned squid, *Loligo pealeii*, in the northwest Atlantic. *Fish. Bull.*, U.S. 94: 212-236.

Cadrin, S.X. and E.M.C. Hatfield. 1999. Stock assessment of inshore longfin squid *Loligo pealeii*. *Northeast Fish. Sci. Cent. Ref. Doc.* 99-12. 107p.

NEFSC [Northeast Fisheries Science Center]. 1999. [Report of the] 29th Northeast Regional Stock Assessment Workshop (29th SAW), Stock Assessment Review Committee (SARC) consensus summary of assessments. *Northeast Fish. Sci. Cent. Ref. Doc.* 99-14. 347p.

Summary Status

Long-term potential catch (MSY)	=	19,600 mt
Biomass corresponding to MSY	=	$B_{MSY} = 80,000 \text{ mt}^1$
Minimum biomass threshold	=	$\frac{1}{2} B_{MSY} = 40,000 \text{ mt}^1$
Stock biomass in 1998	=	42,000 mt ² (Implies stock was not overfished)
F_{MSY}	=	F_{max} (Proxy)
F_{TARGET}	=	75% F_{MSY}
Overfishing definition	=	$F_{THRESHOLD}^3$
F_{1998}	=	$>F_{MSY}$ (Implies overfishing was occurring)
Age at 50% maturity	=	6 months
Size at 50% maturity	=	15 cm (5.9 in.) dorsal-mantle length
Assessment level	=	Biomass dynamics model
Management	=	Atlantic Mackerel, Squid and Butterfish FMP

Winter cohort	$M = 0.30^4$	$F_{0.1} = 0.39^4$	$F_{max} = 0.66^4$	$F_{1998} = 2.5^4$
Summer cohort	$M = 0.30^4$	$F_{0.1} = 0.61^4$	$F_{max} = 1.24^4$	$F_{1998} = 1.1^4$

¹ Derived from NEFSC survey swept-area indices.

² Swept area estimate based on NEFSC Autumn 1998 and Spring 1999 survey data.

³ $F_{THRESHOLD} = F_{MSY}$ when biomass $\geq B_{MSY}$, decreasing linearly to zero at $\frac{1}{2} B_{MSY}$.

⁴ Monthly rates

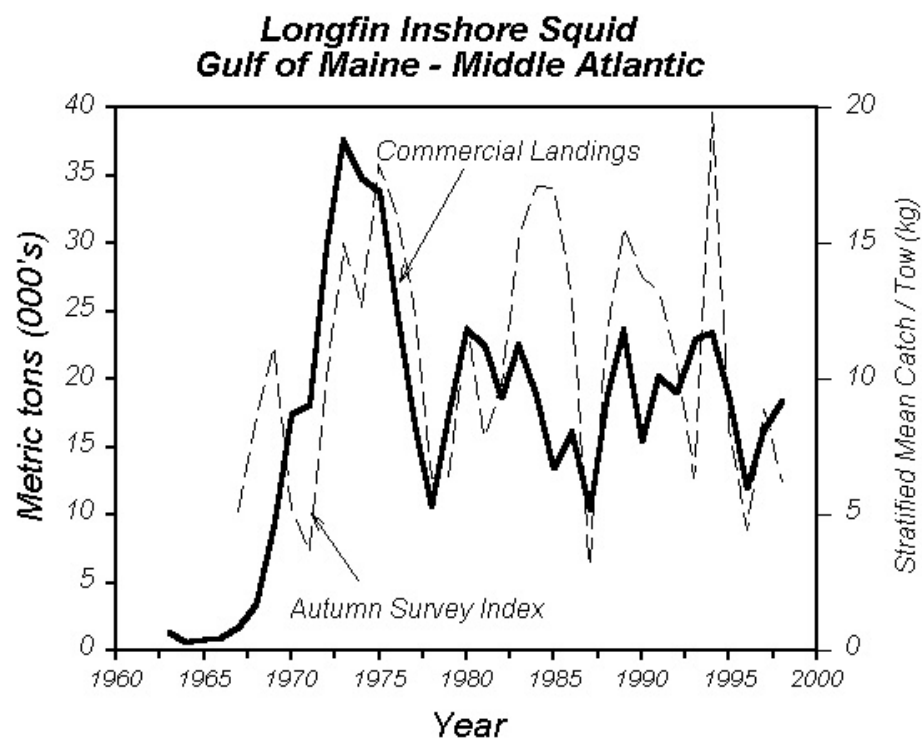


Table 28.1 Recreational catches and commercial landings (thousand metric tons)

Category	Year										
	1979-88	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
	Average										
U.S. recreational	-	-	-	-	-	-	-	-	-	-	-
Commercial											
United States	7.9	23.7	15.4	20.3	19.0	23.0	23.5	18.9	12.0	16.3	18.4
Canada	-	-	-	-	-	-	-	-	-	-	-
Other	10.3	-	-	-	-	-	-	-	-	-	-
Total nominal catch	18.2	23.7	15.4	20.3	19.0	23.0	23.5	18.9	12.0	16.3	18.4